University *of Ljubljana*
Faculty *of Computer and Information Science*

FIRST CYCLE PROFESSIONAL STUDY PROGRAMME
COMPUTER AND INFORMATION SCIENCE

HANDBOOK
for students enrolled for the first time in the first year in the 2023/2024 academic year

Ljubljana, 2023

Main objectives of the programme

Computer and information science is one of the leading breakthrough areas that have been shaping today's economy, education, culture and other activities for several decades now. The striking growth of computer technology dictates the need for highly qualified staff capable of developing, managing and maintaining user and systems technology and the IT systems based on those technologies. The professional study programme is aimed principally at those with an interest in learning to solve practical problems in computer and information science. The programme is comparable to international standards and recommendations, taking into account the rapid development of computer science and new knowledge. In addition to providing a knowledge of all the fundamental subjects necessary for future engineers, the study programmes enable students to tailor their studies according to their own wishes, motivations and strengths, taking into account the various possibilities of professional specialisation. This is helped by the compulsory nine-week work assignment, which acquaints students with the needs of the commercial and public sectors and enables them once they become employed to be productively involved in the work of their selected company. The study programme accordingly provides future engineers with a sufficient professional basis, once they have completed this professional course of study, to be able to keep abreast of technical changes and continue their careers successfully at home as well as at an international level.

General competences

Graduates will be able to resolve practical problems in the area of information technology. They acquire a complete set of competences that enables them to enter directly into a working environment:

- the capacity for critical, analytical and synthetic thinking,
- the capacity to understand and solve technical challenges,
- a knowledge of basic skills in computer science and information technology, including theoretical foundations and practical skills,
- the ability to independently perform less demanding and complex developmental engineering tasks in individual specialised fields and independently solve specific well-defined tasks in other areas of computer and information science,
- the ability to transfer specific computer skills to relevant fields,
- a qualification for group work and the ability to head small groups,
- the ability to become rapidly and productively involved in the working process at a future employer,
- a knowledge of sources of information and their application in professional work,
- the ability to communicate on a professional level in the native language and in one foreign language,
- a knowledge of professional responsibility and understanding of ethics at work,
- sufficient training in the fields of computer science and information technology to enable further study in second-cycle programmes.

Subject-specific competences

- a knowledge of the operating principles of hardware and software, networks, programming languages and applications,
- a knowledge of programming constructs and databases and their effective application to solve problems in the real world,
- the ability to analyse a problem and create appropriate algorithm solutions,
- a knowledge of the appropriate programmer approaches and the capacity to distinguish between poorer and better solutions,

- a knowledge of the mathematical language for consistent and accurate description of phenomena and an understanding of the relationship between a theoretical model and its implementation in various fields of computer science,
- an understanding of the functioning of multifaceted systems of modern communication and their use,
- an awareness of security and insecurity in a network environment and the use of basic security mechanisms,
- a knowledge of the basic business functions and organisation of the selected company (practical assignment).

Admission requirements

Enrolment in the professional study programme Computer and Information Science is open to students who:
- have completed the final examination in any four-year secondary school programme,
- have passed the vocational matura or general matura.

Selection criteria for limited enrolment

In the event of a decision limiting enrolment, candidates will be selected depending on:
- the GPA in the final examination, vocational matura or matura examination, 60 points,
- the GPA of years 3 and 4 of secondary school, 35 points,
- grades in mathematics in years 3 and 4 of secondary school, 5 points.

Criteria for recognising knowledge and skills acquired prior to enrolment

The study programme enables the recognition of relevant knowledge in the field acquired through formal, non-formal or experiential learning. The basis for recognition is the Rules on the procedure and criteria for recognising non-formally acquired knowledge and skills. This type of knowledge can be recognised as part of the completed study requirements, at up to 6 ECTS for one set (the approximate study programme covered in one course) of knowledge acquired outside the Faculty. In the recognition process certificates and other documents are taken into account. Requests for recognition of acquired knowledge will be considered by FRI's Committee for Study Affairs.

Assessment methods

The methods of assessment comply with the UL Statutes and are set out in the curriculums.

Requirements for progression through the course

Students who have completed course units consisting of 53 credit points may enrol in the second year. Students who have completed all the requirements of the first year and course units consisting of 53 credits in the second year may enrol in the third year.

Requirements for retaking a year

To retake a year, students must complete the following:

a) at least half of the requirements from the study programme of that year (30 ECTS),

b) all exams from the years before.

Students can only retake a year once in their course of study; changing programme is also considered retaking a year,

because of the uncompleted requirements of the previous study programme.

Counselling and guidance during study

During the period of study the Career Centre at the Faculty of Computer and Information Science and tutors will be in direct contact with students, guiding their development, exercising concern for their academic success, motivating them towards personal advancement in the profession, and helping and advising them in resolving possible difficulties, problems and crises that can impede students during

their course. If they encounter difficulties, students can also turn to the Career Centre of the University of Ljubljana.

Requirements for transferring between programmes
In accordance with the Criteria for Transferring between Programmes, transferring is possible from study programmes which upon completion guarantee similar competences and which enable the recognition of at least half of the obligations based on the European Credit Transfer System (ECTS) from the first study programme relating to compulsory subjects of the second study programme. Transferring from other programmes is possible after the first year of study.

The requirements for transferring to the first-cycle professional study programme Computer and Information Science from other programmes (academic and professional) are:
- completed requirements for enrolment in the programme,
- at least an equivalent curriculum to Mathematics and Programming 1 in the study programme they are being transferred from (the recognised courses must have at least the same number of credits as the aforementioned subjects),
- the appropriate faculty authority defines, on the basis of a comparison of the two programmes, the requirements to be recognised and the year in which the candidate can enrol, and consequently issues a decision.
Transferring is possible on the basis of the provisions applicable to such programmes.

Requirements for completing the study programme
The requirements for completion of the programme are the passing of all exams and other requirements, including the diploma seminar, in a total of 180 ECTS.

Requirements for completing individual parts of the programme if the programme contains them
The study programme contains no parts that can be completed individually. The programme is integral.

Professional or academic title
• Bachelor of Applied Science

Professional or academic title (abbreviated)
• B.A.Sc.

Year 1

	University Course Code	Course title	Lecturers	Contact hours					Individual student work	Total hours	ECTS	Semesters	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study					
1.	0039655	Introduction to Computer Science	Vlado Stankovski	45		30			105	180	6	1st semester	no
2.	0039651	Programming 1	Janez Demšar	45		30			105	180	6	1st semester	no
3.	0039653	Computer Architecture	Robert Rozman	45		30			105	180	6	1st semester	no
4.	0039647	Mathematics	Polona Oblak	45		30			105	180	6	1st semester	no
5.	0039646	Discrete Structures	Gašper Fijavž	45		30			105	180	6	1st semester	no
6.	0039652	Programming 2	Tomaž Dobravec	45		30			105	180	6	2nd semester	no
7.	0039650	Databases	Matjaž Kukar	45		30			105	180	6	2nd semester	no
8.	0039654	Computer Communications	Mojca Ciglarič	45		30			105	180	6	2nd semester	no
9.	0039648	Operating Systems	Peter Peer	45		30			105	180	6	2nd semester	no
10.	0039649	Introduction to Probability and Statistics	Aleksandar Jurišić	45		30			105	180	6	2nd semester	no
		Total		450	0	300	0	0	1050	1800	60		

Year 2

	University Course Code	Course title	Lecturers	Contact hours					Individual student work	Total hours	ECTS	Semesters	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study					
1.	0070031	Algorithms and Data Structures I	Jurij Mihelič	45		30			105	180	6	1st semester	no
2.	0070034	General elective courses		180		120			420	720	24	1st semester	yes
3.	0070032	Algorithms and Data Structures 2	Andrej Brodnik	45		30			105	180	6	2nd semester	no
4.	0070035	General elective courses		135		90			315	540	18	2nd semester	yes
5.	0069530	Specialist elective course		45		30			105	180	6	2nd semester	yes
		Total		450	0	300	0	0	1050	1800	60		

Year 2, Professional Elective Courses

	University Course Code	Course title	Lecturers	Contact hours					Individual student work	Total hours	ECTS	Semesters	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study					
1.	0039664	Electronic and Mobile Business	Rok Rupnik	45		30			105	180	6	1st semester	yes
2.	0039674	Databases 2	Aljaž Zrnec	45		30			105	180	6	1st semester	yes
3.	0039666	Information Systems	Damjan Vavpotič	45	10	20			105	180	6	1st semester	yes

No.	Code	Subject	Lecturer										
4.	0039665	Graphic Design	Iztok Lebar Bajec, Narvika Bovcon	45		30			105	180	6	1st semester	yes
5.	0039670	Communications Protocols and Network Security	Andrej Brodnik	45		30			105	180	6	1st semester	yes
6.	0039673	Computer Organisation	Robert Rozman	45		30			105	180	6	1st semester	yes
7.	0039662	Digital Circuits	izr. prof. dr. Miha Moškon	45	10	20			105	180	6	1st semester	yes
8.	0039681	Computer Graphics	Iztok Lebar Bajec	45	15	15			105	180	6	1st semester	yes
9.	0039692	Artificial Intelligence	Igor Kononenko	45	6	24			105	180	6	1st semester	yes
10.	0039693	User Interfaces	Aleš Smrdel	45		30			105	180	6	2nd semester	yes
11.	0039678	Compilers and Virtual Machines	Boštjan Slivnik	45		30			105	180	6	2nd semester	yes
12.	0039691	Testing and Quality	Igor Rožanc	45		30			105	180	6	2nd semester	yes
13.	0039684	Information Systems Development	Damjan Vavpotič	45	10	20			105	180	6	2nd semester	yes
14.	0039679	Multimedia Content Production	Borut Batagelj	45	10	20			105	180	6	2nd semester	yes
15.	0039663	Digital Signal Processing	Franc Jager	45		30			105	180	6	2nd semester	yes
16.	0039686	Web Technologies	Aleš Smrdel	45	10	20			105	180	6	2nd semester	yes
17.	0039694	Input-Output Systems	Robert Rozman	45		30			105	180	6	2nd semester	yes

No.	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
18.	0039672	Digital Logic Design	izr. prof. dr. Miha Moškon	45		30			105	180	6	2nd semester	yes
19.	0039675	Data Mining	Tomaž Curk	45	10	20			105	180	6	2nd semester	yes
20.	0041950	The C Programming language	Tomaž Dobravec	15		45			30	90	3	1st semester	yes
21.	0039689	Computer Science Skills	David Modic	15		45			30	90	3	1st semester, 2nd semester	yes
22.	0039690	Computer Science Skills 2	David Modic	15		45			30	90	3	1st semester, 2nd semester	yes
23.	0041949	Topics in Computer and Information Science		45		30			105	180	6	2nd semester	yes
24.	0643540	IT law	Karmen Lutman	45		30			105	180	6	2nd semester	yes
25.	0643424	Organisation Security	David Modic	45	30				105	180	6	1st semester	yes
26.	0643448	Software Security	Matevž Pesek	45		30			105	180	6	2nd semester	yes
27.	0643450	Data Security	David Jelenc	45		30			105	180	6	1st semester	yes
		Total		1125	111	744	0	0	2610	4590	153		

Year 3

	University Course Code	Course title	Lecturers	Contact hours					Individual student work	Total hours	ECTS	Semesters	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study					
1.	0070037	Software Engineering	Igor Rožanc	45	20	10			105	180	6	1st semester	no
2.	0070034	General elective courses		180		120			420	720	24	1st semester	yes

	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
3.	0070039	Industrial Practice						225	315	540	18	2nd semester	no
4.	0070038	Diploma seminar	Franc Solina	45	10	5			120	180	6	2nd semester	no
5.	0069530	Specialist elective course		45		30			105	180	6	2nd semester	yes
		Total		315	30	165	0	225	1065	1800	60		

Year 3, Professional Elective Courses

	University Course Code	Course title	Lecturers	Contact hours					Individual student work	Total hours	ECTS	Semesters	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study					
1.	0039710	IT Governance	Rok Rupnik	45		30			105	180	6	1st semester	yes
2.	0039706	Multimedia Technologies	Alenka Kavčič	45	10	20			105	180	6	1st semester	yes
3.	0039725	Parallel and Distributed Systems and Algorithms	Patricio Bulić	45	10	20			105	180	6	1st semester	yes
4.	0039718	System Software	Branko Šter	45		30			105	180	6	1st semester	yes
5.	0039712	Process Automation	Nejc Ilc, Uroš Lotrič	45	10	20			105	180	6	1st semester	yes
6.	0039724	Embedded Systems	Patricio Bulić	45	10	20			105	180	6	1st semester	yes
7.	0039717	Robotics and Machine Perception	Danijel Skočaj	45		30			105	180	6	1st semester	yes
8.	0039721	Game Technology and Virtual Reality	Peter Peer	45		30			105	180	6	1st semester	yes
9.	0039708	Decision Systems	Aleksander Sadikov	45	10	20			105	180	6	1st semester	yes

	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
10.	0039707	Numerical Methods	Aljaž Zalar	45		30			105	180	6	1st semester	yes
11.	0643451	Programming of Energy-Constrained Devices	Veljko Pejović	45	15	15			105	180	6	1st semester	yes
		Total		495	65	265	0	0	1155	1980	66		

Year 2 and Year 3, General Elective Courses

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0041962	English, level A	Nina Bishop Bostič	30		15			45	90	3	2nd semester	yes
2.	0041963	English, level B	Nina Bishop Bostič	30		15			45	90	3	1st semester	yes
3.	0041964	English, level C	Nina Bishop Bostič	30		15			45	90	3	2nd semester	yes
4.	0041965	Computer Science in Practice I	Slavko Žitnik	5				40	45	90	3	1st semester, 2nd semester	yes
5.	0041966	Computer Science in Practice II	Slavko Žitnik	5				40	45	90	3	1st semester, 2nd semester	yes
6.	0041967	Physical education	Saša Ogrizović			30			60	90	3	1st semester	yes
7.	0096887	Use of IT for study	Damjan Vavpotič	30		15			45	90	3	1st semester, 2nd semester	yes
8.	0643375	Physical education 2	Saša Ogrizović	5		30			55	90	3	2nd semester	yes

	Total	135	0	120	0	80	385	720	24